

## Description

The present invention relates to the field of median barriers for roadways. In particular, the present invention relates to a fixed median barrier having therein a removable barrier to enable traffic moving in one direction to exit from the lane of travel into a second lane, usually designated for traffic travelling in an opposition direction.

Generally a median barrier between a two carriage roadway is designed so that if a vehicle leaves one carriageway and hits the barrier, either because of driver error or vehicle breakdown, the vehicle will be redirected back towards its own carriageway rather than directly into the path of oncoming traffic on the other carriageway. Conventionally such median barriers have been formed by heavy gauge corrugated metal supported by posts or by concrete blocks, the concrete blocks having a concave surface facing each carriageway and tapering in cross-section towards its upper face. It has been found that to provide a permanent opening along a length of the median barrier is extremely dangerous in that catastrophic accidents can occur if a vehicle crashes into either end of the open zone of the barrier.

Various barriers for roadways have hitherto been proposed, including US 4,576,509 which discloses a crash resistant removable barrier adapted to sit laterally across a roadway. The barrier can be opened to pass traffic and closed to bar passage of traffic. The barrier is useful as a control gate to pass authorized vehicles, and form an obstacle to unauthorized vehicles. The barrier disclosed is quite bulky, cumbersome and considered unsuitable for operation as a median barrier of a roadway.

German Patent Specification No DE-A-2,838,637 discloses a removable barrier according to the preamble of claim 1 and adapted to cooperate with a median barrier of a roadway to form, in situ, a barrier between traffic travelling in one direction and traffic travelling in another direction. In this disclosure the removable barrier is formed by at least a pair of opposed corrugated planks which are movable generally parallel to an adjacent pair of corrugated planks such that one movable plank moves outwardly of one of the adjacent planks with the other moving inwardly of a second one of the adjacent planks. By so moving the removable barrier, traffic is permitted to pass through the median barrier between the traffic lanes on either side.

The object of the present invention is to provide an improved removable or retractable barrier for a roadway of the foregoing type adapted to allow traffic to bypass a blockage or accident on a roadway when it might be necessary to do so. It is a preferred objective to provide a movable barrier

of the foregoing type which has improved safety characteristics when closed.

Accordingly, the present invention provides a retractable barrier adapted to cooperate with an intermediate passageway in a fixed median barrier serving as a partition between a first traffic lane and a second traffic lane, said retractable barrier being adapted for translation relative to the median barrier substantially parallel to said median barrier, in order to open or close the intermediate passageway to permit traffic to move through said passageway between said traffic lanes when said passageway is open; characterised in that said retractable barrier comprises at least one moveable barrier member formed as a shell with side faces of said shell being arranged to move outwardly of and alongside of opposed side walls of said fixed median barrier when moving to open said intermediate passageway, said movable or each said movable barrier member, when moved to a closed position, constituting a continuance of said fixed median barrier by providing a substantial barrier between said first traffic lane and said second traffic lane and the or each said movable barrier member being adapted to resist lateral forces upon impact of a vehicle thereon.

By providing the movable barrier member in the form of a shell with opposed walls, both of which are arranged to move outwardly of and alongside of opposed walls of an adjacent side wall of the fixed median barrier, improved strength is provided to the movable barrier when closed and a free end of the fixed median barrier is not exposed to crash impacts from either traffic lane.

Preferably the side faces of the shell of said at least one movable barrier member has a shape conforming to a profile shape of the side walls of said fixed median barrier. Conveniently two barrier members are provided, each of said barrier members being movable in opposite directions when being positioned to open said intermediate passageway. In a further preferred arrangement the movable barrier members include inter-engaging lock means when said intermediate passageway is closed to resist unauthorized movement of said barrier members to open said intermediate passageway.

In a particularly preferred embodiment, fixed holding means are arranged in the intermediate passageway to which the movable barrier member or members is or are retained to resist vehicle impact when the retractable barrier is closed. Conveniently the holding means is located at or adjacent ground level and is permanently installed to provide a guide during movement of the or each barrier member towards the closed position. Thus the holding means provides increased strength to resist vehicle impacts when closed but also pro-

vides a guide for facilitating opening or closing the intermediate passageway.

Conveniently, according to a further aspect of the present invention there is provided a median barrier serving as a partition between a first traffic lane and a second traffic lane, said median barrier comprising a first barrier section aligned with a second barrier section, said first and second barrier sections being spaced apart by an intermediate passageway and a retractable barrier as described above which in a closed position spans said intermediate passageway and in a retracted position is withdrawn from said intermediate passageway permitting free access therethrough between said traffic lanes.

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings, wherein:

Figure 1 shows the removable barrier of the present invention in closed position;

Figure 2 shows the barrier in a partially open position; and

Figure 3 shows the barrier in a substantially open position.

With reference to Figure 1, the removable barrier 1 of the present invention is shown in association with a median barrier 2 of a roadway 3. The median barrier may be of any suitable construction, such as steel or concrete, and may also be of any suitable shape, for example as disclosed in US 4,661,010, US 4,806,044 and US 4,498,803.

The removable barrier 1 may comprise of at least one shell, which preferably conforms substantially to the shape of the median barrier of the roadway.

As can be better seen with reference to Figure 2, the preferred movable barrier shown comprises two formed shells 4, 5. Preferably, the two shells 4, 5 are of metal and shaped similar to the basic profile of the fixed median barrier 2 in order to minimize formation of a protuberance from the barrier which may be undesirable. In a closed or blocking configuration between lanes or sides of the roadway (city bound and out bound traffic), the removable barrier forms a continuance of the median barrier 2. The shells 4, 5 are locked together by suitable locking means 6a, 6b which provides extra rigidity to the removable barrier in the closed position in the event of a vehicle colliding with the barrier.

The two shells 4, 5 may also include internal bracing to minimize damage to the shells in the event of impact by a vehicle. Alternatively, the shells may include shock or impact absorbent material to substantially absorb impact by a vehicle.

The barrier can be opened in a horizontal direction by means of a winch mechanism 7, which may be manually or drivingly operated. The barrier

may alternatively be opened by other suitable means such as pneumatic or hydraulic cylinders or electric motors connected to support wheels.

The barrier may also include holding means to substantially prevent forced access through the barrier and is shown at 8. It comprises a base section which cooperates with the shells 4, 5 to allow the shells to be moved in a horizontal direction. Preferably, the holding means comprises a rail section 9 about which shell engagement means 10, in the form of wheels or rollers are adapted to move. The holding means also provides additional restraint for the barrier if and when impacted by a vehicle. The barrier may also serve to alleviate cross slope draining, which can prove to be a major hazard on roadways, by limiting the passage of water from one lane of traffic to another lane of traffic.

As can be seen in the drawings, on opening, the side faces of the shells 4, 5 move outwardly of and alongside of opposed side faces of the fixed median barrier 2, with the shells 4, 5 moving on the rails 9 of the fixed holding means 8.

Figure 3 shows the barrier in a substantially open position. In this open position vehicles in, say, the city-bound lanes 11 and 12 can pass through the barrier into out bound lane 13, for temporarily travelling in a city bound direction. The vehicles having crossed through the barrier into lane 13 can pass back into lanes 11 and 12 of the roadway via another removable barrier in accordance with the present invention located further along the roadway.

Meanwhile, traffic which usually travels in an outbound direction in lane 13 must travel in lane 14 in order to avoid "head-on" collisions with the city bound traffic temporarily in lane 13. Additional temporary roadway dividers can be placed between lanes 13 and 14 interposed the two open removable barriers to prevent any such head-on collisions.

Alternatively, all vehicles from blocked lanes 11 and 12 can be directed to lanes 13 and 14 to travel in the direction which all traffic in these lanes normally travel.

Thus, the present invention serves to provide a median barrier for a roadway which is relatively easily movable to allow passage therethrough. This serves to allow traffic to bypass a blockage or accident on a roadway.

## Claims

1. A retractable barrier (1) adapted to cooperate with an intermediate passageway in a fixed median barrier (2) serving as a partition between a first traffic lane (12) and a second traffic lane (13), said retractable barrier being



vides a guide for facilitating opening or closing the intermediate passageway.

Conveniently, according to a further aspect of the present invention there is provided a median barrier serving as a partition between a first traffic lane and a second traffic lane, said median barrier comprising a first barrier section aligned with a second barrier section, said first and second barrier sections being spaced apart by an intermediate passageway and a retractable barrier as described above which in a closed position spans said intermediate passageway and in a retracted position is withdrawn from said intermediate passageway permitting free access therethrough between said traffic lanes.

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The two shells 4, 5 may also include internal bracing to minimize damage to the shells in the event of impact by a vehicle. Alternatively, the shells may include shock or impact absorbent material to substantially absorb impact by a vehicle.

The barrier can be opened in a horizontal direction by means of a winch mechanism 7, which may be manually or drivingly operated. The barrier

may alternatively be opened by other suitable means such as pneumatic or hydraulic cylinders or electric motors connected to support wheels.

The barrier may also include holding means to substantially prevent forced access through the barrier and is shown at 8. It comprises a base section which cooperates with the shells 4, 5 to allow the shells to be moved in a horizontal direction. Preferably, the holding means comprises a rail section 9 about which shell engagement means 10, in the form of wheels or rollers are adapted to move. The holding means also provides additional restraint for the barrier if and when impacted by a vehicle. The barrier may also serve to alleviate cross slope draining, which can prove to be a major hazard on roadways, by limiting the passage of water from one lane of traffic to another lane of traffic.

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Meanwhile, traffic which usually travels in an outbound direction in lane 13 must travel in lane 14 in order to avoid "head-on" collisions with the city bound traffic temporarily in lane 13. Additional temporary roadway dividers can be placed between lanes 13 and 14 interposed the two open removable barriers to prevent any such head-on collisions.

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Thus, the present invention serves to provide a median barrier for a roadway which is relatively easily movable to allow passage therethrough. This serves to allow traffic to bypass a blockage or accident on a roadway.

## Claims

1. A retractable barrier (1) adapted to cooperate with an intermediate passageway in a fixed median barrier (2) serving as a partition between a first traffic lane (12) and a second traffic lane (13), said retractable barrier being



adapted for translation relative to the median barrier substantially parallel to said median barrier, in order to open or close the intermediate passageway to permit traffic to move through said passageway between said traffic lanes when said passageway is open; characterised in that said retractable barrier comprises at least one moveable barrier member formed as a shell (4, 5) with side faces of said shell being arranged to move outwardly of and alongside of opposed side walls of said fixed median barrier (2) when moving to open said intermediate passageway, said movable or each said movable barrier member, when moved to a closed position, constituting a continuance of said fixed median barrier (2) by providing a substantial barrier between said first traffic lane (12) and said second traffic lane (13) and the or each said movable barrier member being adapted to resist lateral forces upon impact of a vehicle thereon.

2. The retractable barrier of claim 1, characterised in that side faces of the shell (4, 5) of said at least one movable barrier member has a shape conforming substantially to a profile shape of the side walls of said fixed median barrier (2).

3. The retractable barrier of claim 1, characterised in that two said movable barrier members (4, 5) are provided, each of said barrier members being movable in opposite directions when being positioned to open said intermediate passageway.

4. The retractable barrier of claim 1, characterised in that said movable barrier members (4, 5) include interengaging lock means (6) when said intermediate passageway is closed to resist unauthorized movement of said barrier members to open said intermediate passageway.

5. The retractable barrier of claim 1, characterised by further including fixed holding means (8) arranged in said intermediate passageway to which said at least one movable barrier member is retained to resist vehicle impact when said retractable barrier (1) is closed.

6. The retractable barrier of claim 5, characterised in that said fixed holding means (8) acts as a guide during movement of said at least one barrier member (4, 5) towards said closed position.

7. The retractable barrier of claim 1, characterised in that said fixed holding means (8) is positioned substantially at ground level and extends across said intermediate passageway.

8. The retractable barrier of claim 7, characterised in that said fixed holding means (8) includes a rail section (9) about which one of wheels and rollers of said retractable barrier are adapted to move.

9. The retractable barrier according to claim 8, and wherein on opening, the side faces of the shells (4, 5) move outwardly of and alongside of opposed side faces of the fixed median barrier (2), with the shells (4, 5) moving on the rails (9) of the fixed holding means (8).

10. The retractable barrier of claim 9, characterised by further including means (7) for moving said at least one barrier member whereby when said retractable barrier is open, said at least one barrier member is bodily moved free of said intermediate passageway, said holding means (8) remaining in place in said intermediate passageway.

11. The retractable barrier according to any one of claims 1 to 10 in combination with a median barrier serving as a partition between a first traffic lane and a second traffic lane, said median barrier comprising a first barrier section aligned with a second barrier section, said first and second barrier sections (2) being spaced apart by an intermediate passageway, and wherein the retractable barrier (1), while in a closed position, spans said intermediate passageway and, in a retracted open position, is withdrawn from said intermediate passageway thereby permitting free access therethrough between said traffic lanes.

#### Patentansprüche

1. Zurückziehbare Leitplanke (1) zum Zusammenwirken mit einem Zwischendurchlaß in einer festen mittleren Leitplanke (2), die als Trennwand zwischen einer ersten Fahrbahn (12) und einer zweiten Fahrbahn (13) dient, wobei die zurückziehbare Leitplanke bezüglich der mittleren Leitplanke im wesentlichen parallel zu dieser mittleren Leitplanke verschiebbar ist, um den Zwischendurchlaß zu öffnen oder zu schließen, damit sich der Verkehr durch den Durchlaß zwischen den Fahrbahnen bewegen kann, wenn der Durchlaß offen ist; dadurch gekennzeichnet, daß die zurückziehbare Leitplanke wenigstens einen als Hülse (4, 5) aus-



- gebildeten beweglichen Leitplankenteil aufweist, wobei die Seitenflächen der Hülse so ausgebildet sind, daß sie sich außerhalb und längs der entgegengesetzten Seitenwände der festen mittleren Leitplanke (2) bewegen, wenn sie zum Öffnen des Zwischendurchlasses verschoben werden, wobei der bewegliche oder jeder bewegliche Leitplankenteil bei Bewegung in eine geschlossene Stellung eine Fortsetzung der festen mittleren Leitplanke (2) bildet, indem er eine völlige Sperre zwischen der ersten Fahrbahn (12) und der zweiten Fahrbahn (13) bildet und der oder die beweglichen Leitplankenteile geeignet sind, seitlichen Kräften beim Aufprall eines Fahrzeugs auf dieselben zu widerstehen.
2. Zurückziehbare Leitplanke nach Anspruch 1, dadurch gekennzeichnet, daß die Seitenflächen der Hülse (4, 5) des wenigstens einen beweglichen Leitplankenteils eine Form aufweisen, die im wesentlichen einer Profilform der Seitenwände der festen mittleren Leitplanke (2) angepaßt ist.
  3. Zurückziehbare Leitplanke nach Anspruch 1, dadurch gekennzeichnet, daß zwei dieser beweglichen Leitplankenteile (4, 5) vorgesehen sind, deren jeder in entgegengesetzten Richtungen verschiebbar ist, wenn er so angeordnet wird, daß der Zwischendurchlaß geöffnet wird.
  4. Zurückziehbare Leitplanke nach Anspruch 1, dadurch gekennzeichnet, daß die beweglichen Leitplankenteile (4, 5) ineinandergreifende Verriegelungstelle (6) aufweisen, wenn der Zwischendurchlaß geschlossen ist, um einer unerlaubten Verschiebung der Leitplankenteile zum Öffnen des Zwischendurchlasses zu widerstehen.
  5. Zurückziehbare Leitplanke nach Anspruch 1, gekennzeichnet durch eine feste Halteeinrichtung (8), die im Zwischendurchlaß angeordnet ist, auf der der wenigstens eine bewegliche Leitplankenteil gehalten ist, um einem Fahrzeugaufprall zu widerstehen, wenn die zurückziehbare Leitplanke (1) geschlossen ist.
  6. Zurückziehbare Leitplanke nach Anspruch 5, dadurch gekennzeichnet, daß die feste Halteeinrichtung (8) als Führung während der Verschiebung des wenigstens einen Leitplankenteils (4, 5) in die geschlossene Stellung wirkt.
  7. Zurückziehbare Leitplanke nach Anspruch 1, dadurch gekennzeichnet, daß die feste Halteeinrichtung (8) im wesentlichen in Bodenhöhe angeordnet ist und sich quer über den Zwischendurchlaß erstreckt.
  8. Zurückziehbare Leitplanke nach Anspruch 7, dadurch gekennzeichnet, daß die feste Halteeinrichtung (8) einen Schienenabschnitt (9) aufweist, auf und um den sich die Räder und Rollen der zurückziehbaren Leitplanke bewegen können.
  9. Zurückziehbare Leitplanke nach Anspruch 8, bei welcher beim Öffnen die Seitenflächen der Hülsen (4, 5) sich außerhalb und längs der entgegengesetzten Seitenflächen der festen mittleren Leitplanke (2) verschieben, wobei die Hülsen (4, 5) sich auf den Schienen (9) der festen Halteeinrichtung (8) bewegen.
  10. Zurückziehbare Leitplanke nach Anspruch 9, gekennzeichnet durch eine Einrichtung (7) zum Verschieben des wenigstens einen Leitplankenteils, wodurch, wenn sich die zurückziehbare Leitplanke in geöffneter Stellung befindet, der wenigstens eine Leitplankenteil sich als Ganzes aus dem Zwischendurchlaß herausbewegt, wobei die Halteeinrichtung (8) in ihrer Lage im Zwischendurchlaß verbleibt.
  11. Zurückziehbare Leitplanke nach einem der Ansprüche 1 bis 10 in Verbindung mit einer als Trennwand zwischen einer ersten Fahrbahn und einer zweiten Fahrbahn dienenden mittleren Leitplanke, wobei die mittlere Leitplanke einen ersten Leitplankenabschnitt aufweist, der mit einem zweiten Leitplankenabschnitt fluchtet, der erste und zweite Leitplankenabschnitt (2) durch einen Zwischendurchlaß voneinander getrennt sind, und bei welcher die zurückziehbare Leitplanke (1), während sie sich in einer geschlossenen Stellung befindet, den Zwischendurchlaß überspannt und in einer zurückgezogenen geöffneten Stellung aus dem Zwischendurchlaß zurückgezogen ist, wodurch eine freie Durchfahrt zwischen den Fahrbahnen möglich ist.

#### Revendications

1. Barrière rétractable (1) adaptée de façon à coopérer avec un passage intermédiaire situé dans une barrière intermédiaire (2) fixe, servant de paroi de séparation entre une première voie de circulation (12) et une deuxième voie de circulation (13), ladite barrière rétractable étant adaptée de façon à se déplacer par rapport à la barrière intermédiaire, sensiblement parallèlement à ladite barrière intermédiaire.



- diaire, en vue d'ouvrir ou de fermer le passage intermédiaire, de façon à permettre à une circulation de passer par ledit passage entre lesdites voie de circulation, lorsque ledit passage est ouvert; caractérisée en ce que ladite barrière rétractable comprend au moins un organe formant barrière déplaçable se présentant sous forme d'enveloppe (4, 5), les faces latérales de ladite enveloppe étant agencées de façon à se déplacer vers l'extérieur et le long des parois latérales opposées de ladite barrière intermédiaire (2) fixe, lors de son déplacement pour d'ouvrir ledit passage intermédiaire, ledit organe formant barrière déplaçable ou chaque dit organe formant barrière déplaçable, lorsqu'il est déplacé vers une position fermée, constituant un prolongement de ladite barrière intermédiaire fixe (2) en formant une barrière substantielle entre ladite première voie de circulation (12) et ladite deuxième voie de circulation (13) et le ou chaque dit organe formant barrière déplaçable étant adapté de façon à résister à des forces latérales, lors de l'impact d'un véhicule sur ce dernier.
2. Barrière rétractable selon la revendication 1, caractérisée en ce que les faces latérales de l'enveloppe (4, 5) dudit au moins un organe formant barrière déplaçable ont une forme se conformant sensiblement à une forme profilée des parois latérales de ladite barrière intermédiaire fixe (2).
  3. Barrière rétractable selon la revendication 1, caractérisée en ce que deux desdits organes formant barrière (4, 5) déplaçables sont prévus, chacun desdits organes de barrière étant déplaçable dans des directions opposées, lorsqu'ils sont déplacés de façon à ouvrir ledit passage intermédiaire.
  4. Barrière rétractable selon la revendication 1, caractérisée en ce que lesdits organes formant barrière (4, 5) déplaçables comprennent des moyens de verrouillage (6) interengageables, lorsque ledit passage intermédiaire est fermé, de façon à résister à un mouvement non autorisé desdits organes de barrière afin d'ouvrir ledit passage intermédiaire.
  5. Barrière rétractable selon la revendication 1, caractérisée par le fait de comprendre en outre un moyen de maintien (8) fixe agencé dans ledit dans ledit passage intermédiaire, sur lequel est fixé ledit au moins un organe formant barrière déplaçable, en vue de résister à un impact de véhicule lorsque ladite barrière rétractable (1) est fermée.
  6. Barrière rétractable selon la revendication 5, caractérisée en ce que ledit moyen de maintien (8) fixe sert de guide durant le déplacement dudit au moins un organe formant barrière (4, 5) vers ladite position fermée.
  7. Barrière rétractable selon la revendication 1, caractérisée en ce que ledit moyen de maintien (8) fixe est disposé sensiblement au niveau du sol et travers ledit passage intermédiaire.
  8. Barrière rétractable selon la revendication 7, caractérisée en ce que ledit moyen de maintien (8) fixe comprend une section de rail (9) autour de laquelle des roues et des rouleaux de ladite barrière rétractable sont adaptés de façon à ce déplacer.
  9. Barrière rétractable selon la revendication 8, dans laquelle lors de l'ouverture, les faces latérales des enveloppes (4, 5) se déplacent vers l'extérieur et le long des faces latérales opposées de la barrière intermédiaire (2) fixe, avec les enveloppes (4, 5) se déplaçant sur les rails (9) du moyen de maintien (8) fixe.
  10. Barrière rétractable selon la revendication 9, caractérisée par le fait de comprendre en outre un moyen (7) servant à déplacer ledit au moins un organe formant barrière, de manière que, lorsque ladite barrière rétractable est ouverte, ledit au moins un organe formant barrière soit déplacé d'un seul tenant de façon libre par rapport audit passage intermédiaire, ledit moyen de maintien restant en place dans ledit passage intermédiaire.
  11. Barrière rétractable selon l'une quelconque des revendications 1 à 10, en combinaison avec une barrière intermédiaire servant de paroi de séparation entre une première voie de circulation et une deuxième voie de circulation, ladite barrière intermédiaire comprend une première section de barrière alignée avec une deuxième section de barrière, lesdites première et deuxième sections de barrières (2) étant espacées par un passage intermédiaire, et dans laquelle la barrière rétractable (1), tandis qu'elle se trouve dans une position fermée, enjambe ledit passage intermédiaire et, dans une position ouverte rétractée, est extraite dudit passage intermédiaire, de manière à permettre un accès libre à ce dernier entre lesdites voies de circulations.